SPRT®

Micro Dot Matrix Printers User's Manual

V1.1

Beijing Spirit Technology Development Co, Ltd.

Before using this product, please read the manual and keep it for later use

2010.6

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Introduction

SP series dot panel printer is dot matrix smart printer developed by Beijing Spirit Technology Development Co, Ltd facing the 21st century.Machine itself uses the new import core comes with single - chip computer,small volume、light weight、fully featured、high-speed、high definition、good appearance、easy operation and easy connection .etc.SP series dot matrix printers have complete models,standard installation dimension,is the ideal matching product for updating by Medical equipment、fire control、industry control and other instruments.

SP micro dot matrix printers not only can print ASCII characters, but also can print English, Greek, German, French, Russian, Japanese katakana and GB Chinese character library level I, II, a large number of mathematics symbols, special-purpose symbols and various kinds of graphic and curving symbols. May by commands replace the printed word line spacing and character size, self-define partial code character and self-test.

SP micro dot matrix printers have windows driver, can print various characters、chinese and figures directly under WINDOWS of PC.

Chapter 1 Feature and Performance

1.1 Features

◇ Adopt impact dot-matrix print method.

◇Special design for available being installed on the vertical panel of the instrument or equipment conveniently.

◇Comes with single - chip processor,have standard parallel or serial,could online use with various microcomputers or smart instruments conveniently.

◇Real time commands to print chinese、character、figure and others,also can print standard 6×7ASCIIcharacter and 16×16、12×12 chinese.Command set could compatible with traditional printer.

◇Speed have 1.2line/s、0.7line/s、0.4 line/s、2.5 line/s、1.5 line/s by model.

◇Self-test ,print full codes,character has high definition and elegant fonts.

◇ Power DC 5V±5%,1.5A

◇Operation temp 0~50℃

◇Can work under DOS and Windows interface.

1.2 Performance Index

◇Print Method: impact dot-matrix

◇ Print paper: plain white paper,width: 44.5±0.5mm or 57.5±0.5mm

Inner diameter: 40mm (max.)

Outer diameter: 80mm (max.)

◇GB level I, II Chinese fonts library.

◇ Enough buffer 32K

◇Print font: total 448 characters, including 96 ASCII characters, Greek, German, French letters, Russian, Japanese katakana and partial Chinese characters, mathematics symbols, print symbols and graphic symbols

◇Character structure: ANK: 6×7 dots、Chinese: 8×16 or 6×12,

Chinese character: 16×16/12×12

◇Graphic symbols: 6×8 dots

◇Interface: parallel interface (compatible with CENTRONICS) or serial interface (compatible with RS-232C or TTL).

◇Interface connector: parallel port: 26-pin flat cable socket (T is DB25 orifice); serial port: 10-pin flat cable socket or 5-pin single-row socket（T is DB25 needle）;

◇ Control code: ESC、FS control codes

◇ Reliability：MCBF （Average lines of none error）Reliability: MCBF:（5～15）× 10^6

◇ Power：DC5V±5% , 1.5A

◇ Operation temp：0～50℃,relative temp：10～80%

◇ Installation dimension details see the chapter 2

The Main Characteristics of SP **Series Printers**

Model	Character/line （5×7）	Character dimension(mm)	Dots/line	Speed（line/s）
16Series	16	1．8×2.5(W×H)	96	1.2
24 Series	24	1．7×2.4(W×H)	144	0.7
40Series	40	1．1×2.4(W×H)	240	0.4
24F Series	24	1．7×2.6(W×H)	144	2.5
40F Series	40	1．1×2.6(W×H)	240	1.5

Chapter 2 System Installation

2.1 Installation Size

The printer's outline dimension is as Fig. 2-1 shows:

A

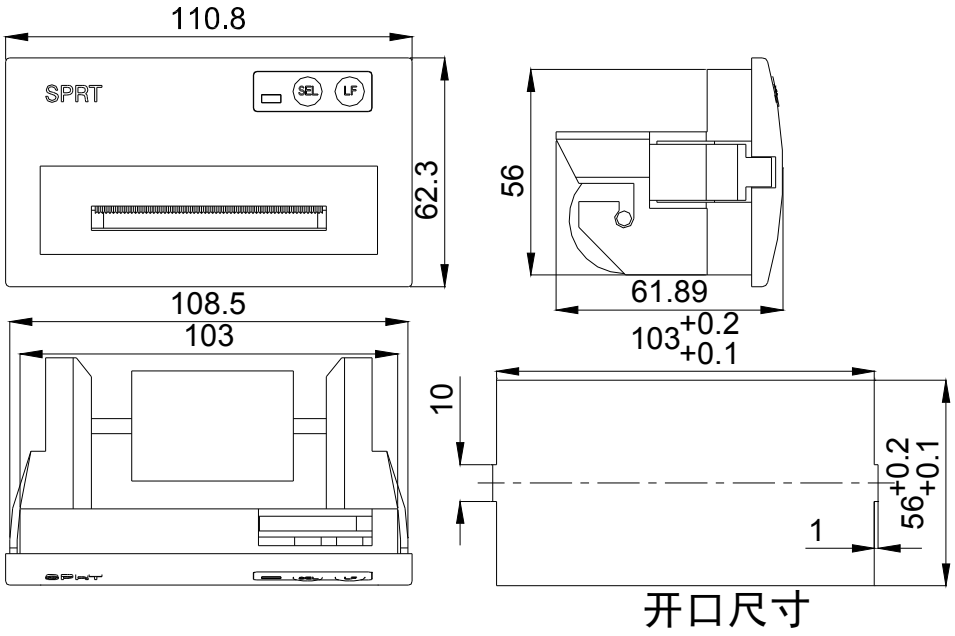


Figure2－1

T

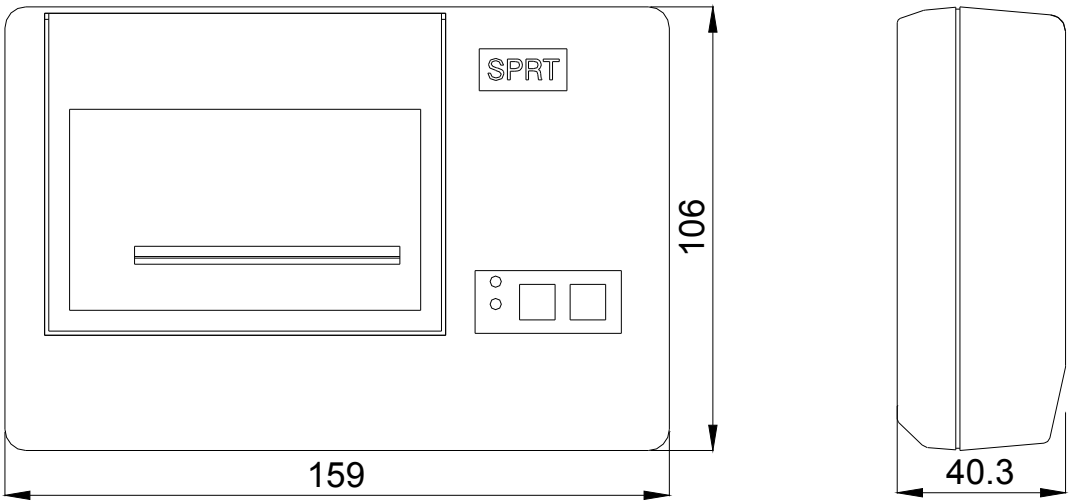


Figure2－2

C

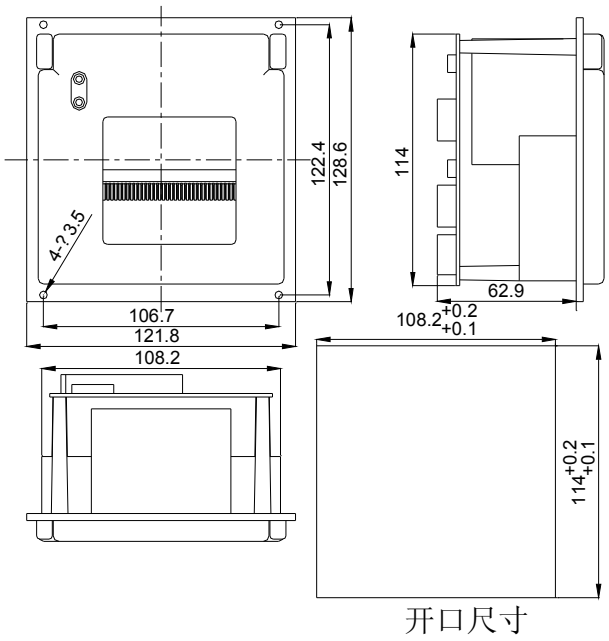


Figure 2－3

DN

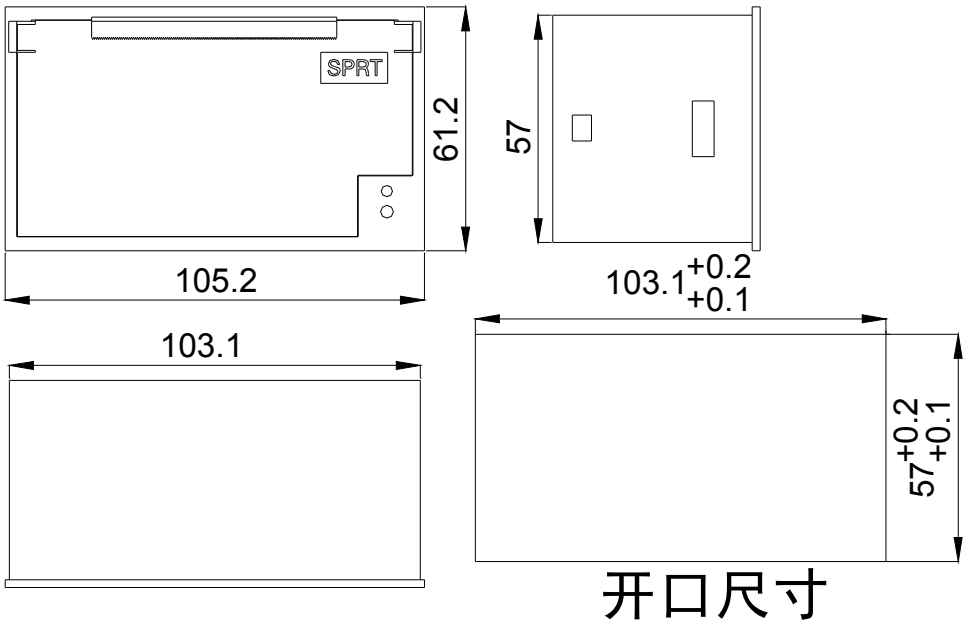


Figure 2－4

DⅦ

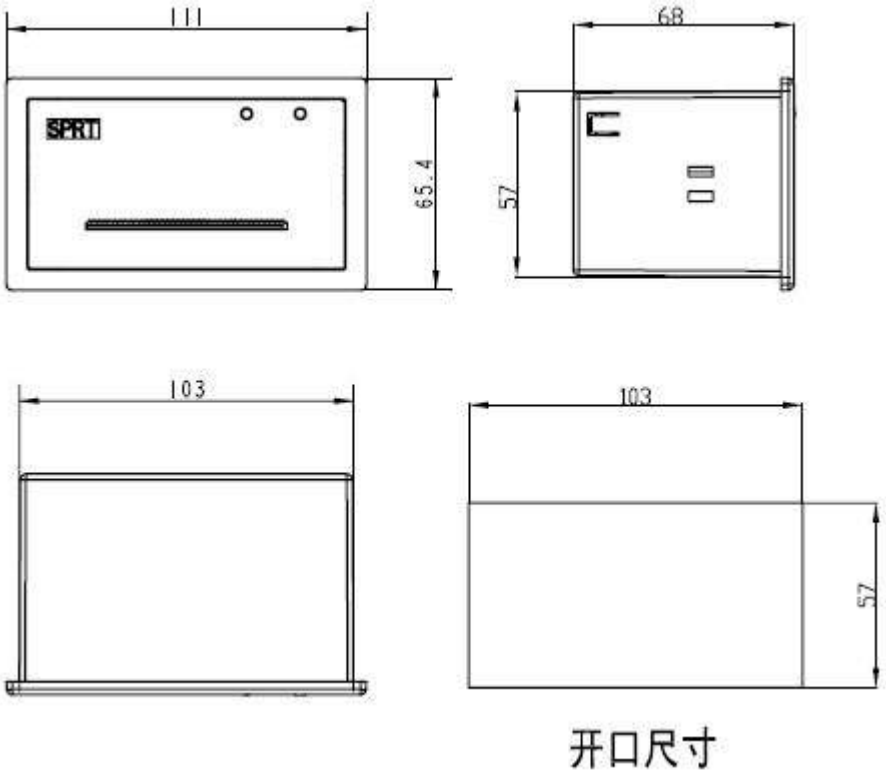


Figure 2－5

2.2 Paper Roll Installation

SP series dot matrix printer uses 44.5mm/57.5mm paper roll, the paper has already been installed at ex-factory for SP micro dot matrix printers, but the paper head has not been inserted in the print head, this is in order to prevent the print head from damage while transporting the printer for long-distance or storing it for a long time, so must insert the head of the paper roll in the print head firstly before using the printer. The general steps of installing the paper for SP series printers are as follows:

A：

（1）Take down the front cover of the printer as Fig. 2-6 shows;

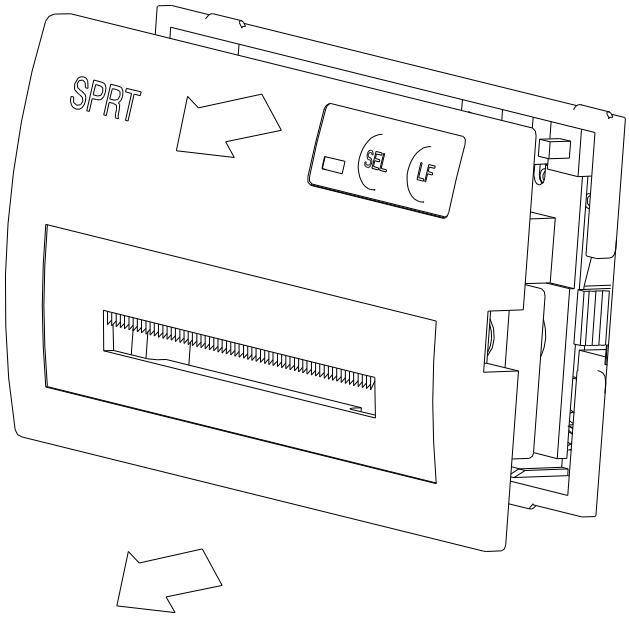


Figure 2－6

（2）Take down the whole printer from the instrument panel, please according to Fig. 2-7 shows: clamp the two sides movable handle of the printer with fingers, take down the whole printer from the instrument panel, please confirm the power of the printer has already been turned off before taking down the printer ;

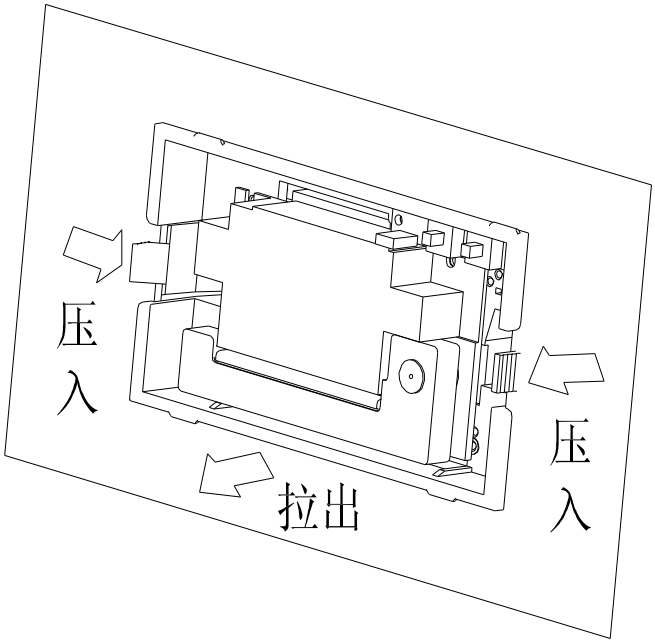


Figure 2－7

（3）Take down the paper roller from the printer (see Fig.2-8), if there is already paper in the printer, can jump over this step to the fifth step;

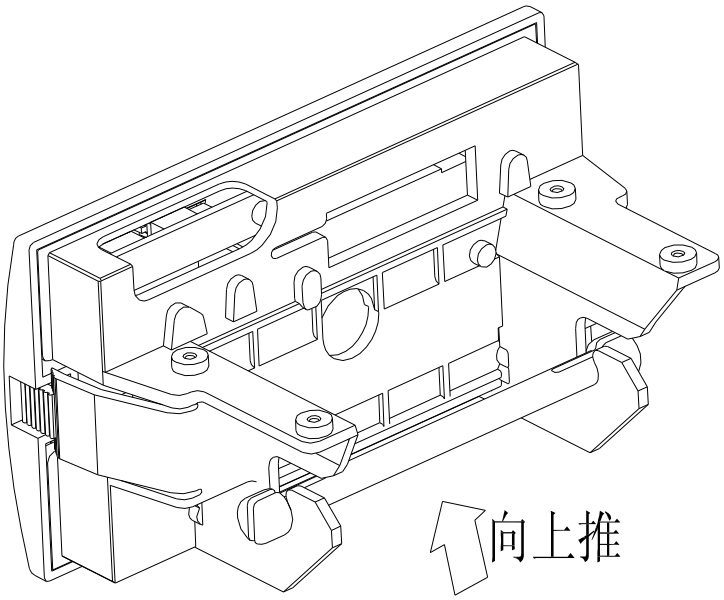


Figure 2－8

（4）Put the new paper on the paper roller, and install the roller firmly according to Fig.2-9

shows, so that it won't lose out.

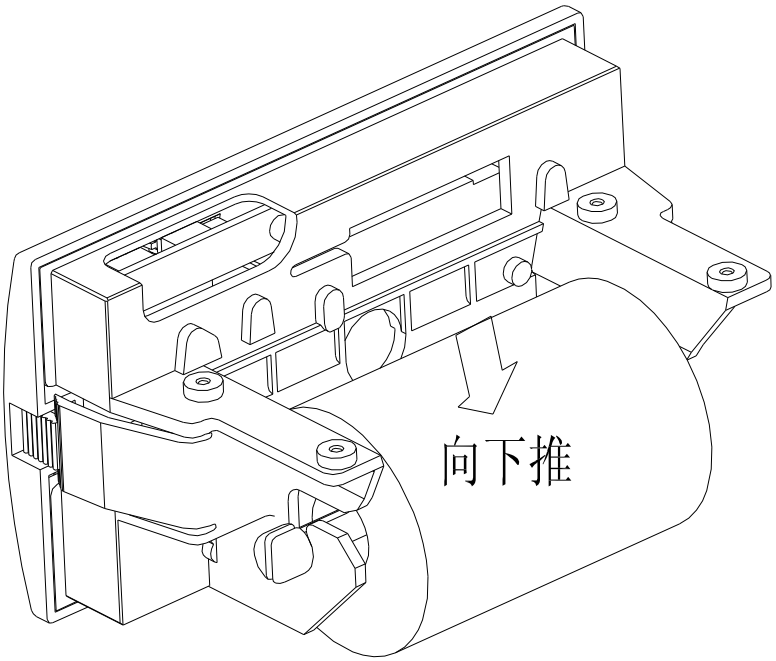


Figure 2－9

（5）Cut the paper end like Fig.2-10

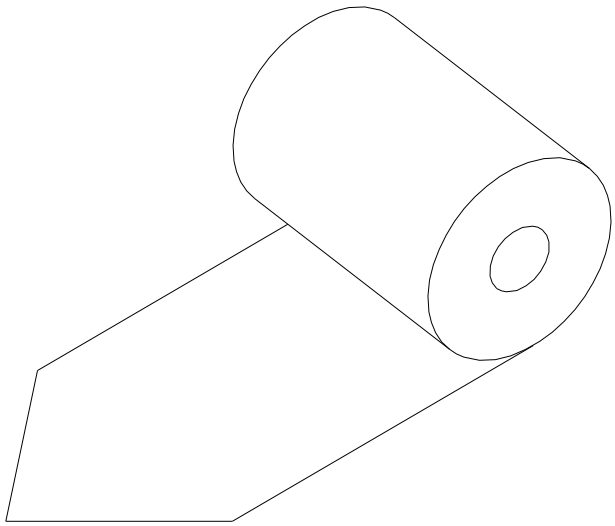


Figure 2－10

（6）Put through the power of printer, press SEL button, make SEL indicator to put out, then press LF button, make the print head to turn, and insert the end of paper into the paper-in slot by hand and make sure that the paper end appears from above the print head, the paper should appear for a certain length, press LF button or SEL button again. Turn off the power and close the front cover, pull the paper end out through the paper-out slot in the front cover.

（7）Install the whole printer to the instrument panel according to following Fig.

C,DN series is opening front panel and press feed.

T series is opening front cover,first press ESL button,then feed button.

Notice：pls not use hand to pull paper forward or back

DⅦ：

（1） As figure 2-11：

Push panel center inward,then inner shell will auto eject when released.

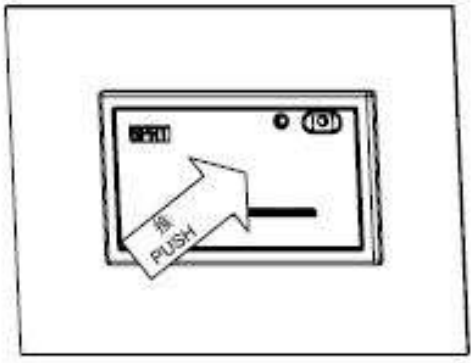


Figure2－11

（2）After inner shell ejected,hold both sides and pull them outward until the end as direction of figure 2-12,rotate it upward and press the whole downward,until fastened.

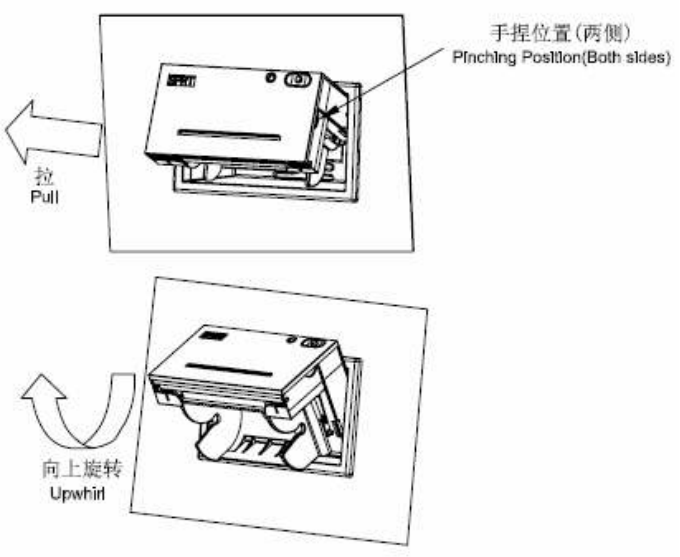


Figure 2-12

（3）Install paper roll to paper reel as figure 2-13,hold both sides of paper reel,put paper roll into paper case,then release paper reel and fastened it.

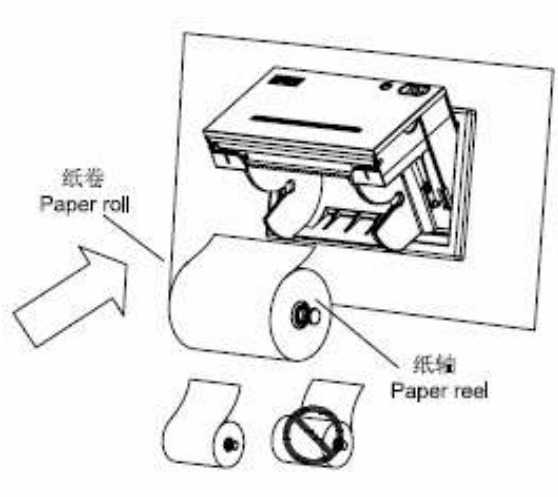


Figure- 13

（4）Switch on,press feed button and insert paper from feeding paper slot,press feed button again to stop feeding after paper comes out. As figure2-14：

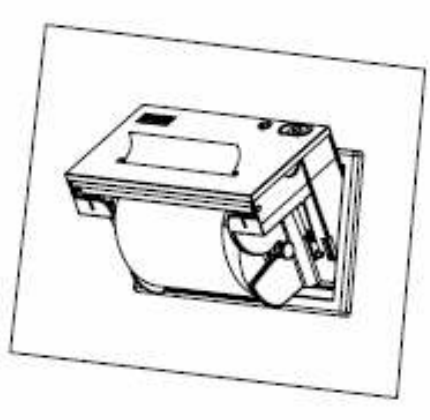


Figure2－14

（5）Hold two sides of inner shell,rotate inner shell downward,and push it inward as the same time.

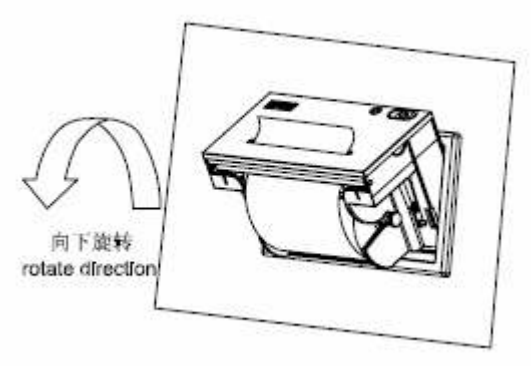


Figure 2－15

（6）

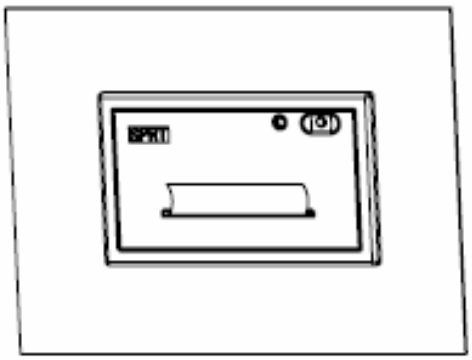


Figure 2－16

Push inner shell fully,fastened with outer,paper installation is over.As figure 2-16：

Notice：

1、 The fluffy paper roll will not be pushed easily and happen paper jam, hold the paper tightly and push it inward as the direction of figure 2-17 until inner shell is inserted

fully.

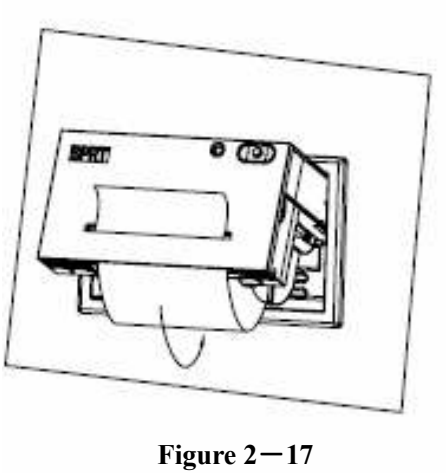


Figure 2－17

2、When fail to push inner shell inward,pls pull out then push again,not use too big strength,or the printer will be damaged.

2.3 Power Supply Connection

Dot matrix printer use +5V DC power.

SP micro dot matrix printers adopt single DC+5V power supply.

A two-line power cable with plug has been offered. The plug has polarity protection mechanisms, can be inserted directly in the socket which is on the control panel of SP micro dot matrix printers. The red line of the power cable should be connected to the positive pole (+) of power, the white line should be connected to the negative pole (–) of power. Please note that the polarity of the power shouldn't be connected incorrectly, the voltage of the power must be in the permitting range, otherwise will cause permanent damage to the printer.

Chapter 3 Printer Operation

3.1 Serial Interface Connection

The serial interface of SP micro dot matrix printers is compatible with RS-232C standard or TTL, support RTS/CTS and XON/XOFF protocols,the interface sockets are IDC10 needle socket、DB25 hole socket、 5-pin single row socket. The pin order of serial port is as Fig. 3-1 shows:

IDC10 needle socket No. as figure 3-1

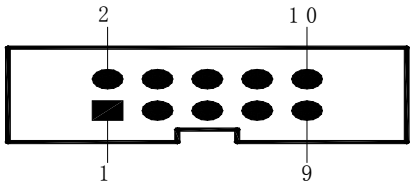


Figure 3－1　Pin order of IDC10 needle serial interface

DB25 hole serial interface socket No. as figure 3-2

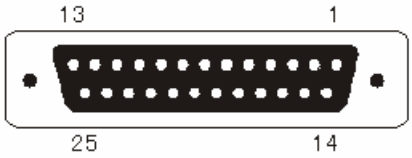


Figure 3－2　DB25 hole serial interface socket No.

5PIN single row serial interface socket No. as figure3-3

Figure3-3 5PIN single row serial interface socket No.

3.1.1　Pin assignment of CF series interface

CF series interface use IDC-10 socket,pin assignment as figure3-4

Signal	Pin No.	source	Instruction
RXD	3	Host	Printer receives data from host
TXD	5	Printer	Printer transmits control code X-ON/X-OFF and data to host when using X-ON/X-OFF handshaking protocol
CTS	4	Printer	Signal “MARK” indicates that the printer is “BUSY” and unable to receive data; “SPACE” indicates that the printer is “READY” for receiving data
GND	9	—	Signal Ground

Figure 3-4　Pin assignment of CF series serial interface socket

3.1.2 Pin assignment of DⅦ series interface

DⅦ series serial sockets have COM1 and COM2,both use IDC-10,their function are the same,only the orders of pin assignment are different,assignment detail see the figure 3-5and 3-6. Notice: Do not use both sockets at the same time.

Signal	Pin No.	Source	Function
TXD	2	Printer	Printer sends data to host
RXD	3	Host	Printer receives data from host
CTS	8	Printer	Printer and host flow control signal(Busy)
DSR	6	Printer	Same to signal CTS
DCD	1	Printer	Same to signal CTS
GND	5	—	

Figure 3-5 Pin assignment of DⅦ series COM1 socket

Signal	Pin No.	Source	Function
TXD	3	Printer	Printer sends data to host
RXD	5	Host	Printer receives data from host
CTS	6	Printer	Printer and host flow control signal(Busy)
DSR	2	Printer	Same to signal CTS
DCD		Printer	Same to signal CTS
GND	9	—	

Figure 3-6 Pin assignment of DⅦ series COM2 socket

3.1.3 Pin assignment of other series（except CF、DVII） interfaces

Pin assignment of serial interface （except CF）as figure3-7

Signal	Pin No. of IDC10 socket	Pin No. of DB25 socket	Pin No. of 5PIN socket	Source	Instruction
RXD	3	2	3	Host	Printer receives data from host
TXD	2	3	2	Printer	Printer transmits control code X-ON/X-OFF and data to host when using X-ON/X-OFF handshaking protocol
CTS	8	5,8	4	Printer	Signal “MARK” indicates that the printer is “BUSY” and unable to receive data;

					“SPACE” indicates that the printer is “READY” for receiving data.
DSR	6	6	1	Printer	Signal “SPACE” indicates that the printer is “ONLINE”
GND	5	7	5	—	Signal Ground
DCD	1	8		Printer	Same to signal CTS

Figure 3-7 Pin assignment of serial interface socket(except CF)

Notice:① “Source” denote the source that signal come from;

② Logical signal level is EIA

3.1.4 Serial setting of CF and TF series

About CF and TF serial, the baud rate in serial interface mode is selected in the range of 1200, 2400, 4800, and 9600bps and it is set by DIP switch on the control panel. You can do some adjustments according to your demands.

Also you can select suitable baud rate according to Fig.3-8. It has set the baud rate to 9600bps at ex-factory.

transmission speed （bps）	K1	K2
1200	OFF	OFF
2400	ON	ON
4800	OFF	ON
9600	ON	OFF

Figure 3-8 CF and TF series baud rate setting

The data structure of serial interface is as Fig.3-9 shows:

Start Bit	Data Bit	Parity Bit	Stop Bit
1bit	7/8bits	1bit	1bit

Fig.3-9 Data Structure of Serial Interface

Thereof the start bit and stop bit are both 1 bit. Data bit is 7 or 8 bits,parity bit is 1bit.The checking mode and data bit can be selected through DIP switch K4、K5 and K6, as Fig.3-10 shows. It has set no parity ,8bit data at ex-factory.

Checking mode and data bit	K4	K5	K6

8bits data odd parity	ON	OFF	OFF
8bits data even parity	OFF	ON	OFF
8bits data no parity	OFF	OFF	OFF
7bits data odd parity	ON	OFF	ON
7bits data even parity	OFF	ON	ON
7bits data no parity	OFF	OFF	ON

Figure 3-10 Asynchronous transfer format

There are two kinds of handshaking modes for selection, one is mark control mode, another is X-ON/X-OFF protocol mode, they can be selected by DIP switch K3, as Fig.3-6 shows. It is K3=OFF at ex-factory. Mark signal still be effective in the X-ON/X-OFF mode.The description for the two kinds of handshaking mode is as Fig.3-11 shows.

DIP's K3	Handshaking Mode	Data Direction	RS-232C Interface Signal
ON	Mark Control	In	Signal CTS and RTS are SPACE status
		Out	Signal CTS and RTS are Mark status
OFF	X-ON/X-OFF Control	In	Send X-ON code 11H on TXD signal line
		Out	Send X-OFF code 13H on TXD signal line

Figure 3－11 Two handshaking modes

3.1.5 DVII series serial setting

About CF and TF serial, the baud rate in serial interface mode is selected in the range of 1200, 2400, 4800, 9600、19200、38400、57600 and115200 bps, and it is set by setup tool. It has set the baud rate to 9600bps at ex-factory. The default printing direction and Chinese method are optional, default are: inverse and ANK.Integrate 16×16、12×12 Chinese,and default could select from 16×16、12×12 Chinese,default value: 16×16.Setting commands of serial parameter、printing direction、Chinese method and font matrix detail see chapter4.3.

3.1.6 Other series（except CF、TF and DVII） serial interface setting

About other serial, the baud rate in serial interface mode is selected in the range of 150, 300,

1200,2400,4800, 9600、and 19200 bps, and it is set by DIP switch. You can do some adjustments according to your demands. Select the proper baud rate as figure3-12.It has set the baud rate to 9600bps at ex-factory.

transmission speed （bps）	K1	K2	K3
150	ON	ON	ON
300	OFF	ON	ON
600	ON	OFF	ON
1200	OFF	OFF	ON
2400	ON	ON	OFF
4800	OFF	ON	OFF
9600	ON	OFF	OFF
19200	OFF	OFF	OFF

Figure 3-12　Baud rate setting

The data structure of serial interface is as Fig.3-13 shows:

Start bit	Data bit	Parity bit	Stop bit
1bit	7/8bit	1bit	1bit

Figure3－13　Asynchronous transfer format

The start bit and stop bit are both 1 bit. Data bit is 7 or 8 bits. Parity bit is 1 bit.Only even parity is allowed when the data is 7 bits. The checking mode can be selected through DIP switch K5 and K6, as Fig.3-14 shows. It has set no parity and 8 bits data at ex-factory.

Checking mode and data bit	K5	K6
8bits no parity	ON	ON
8bits data data odd parity	ON	OFF
8bits data even parity	OFF	ON
7bits data even parity	OFF	OFF

Figure 3-14 Asynchronous transfer format

There are two kinds of handshaking modes for selection, one is mark control mode, another is X-ON/X-OFF protocol mode, they can be selected by DIP switch K4, It is K4=OFF at ex-factory. Mark signal still be effective in the X-ON/X-OFF mode.The description for the two kinds of handshaking mode is as Fig.3-15 shows.

DIP's K4	Handshaking Mode	Data Direction	RS-232C interface signal
OFF	Mark Control	In	DCD and RTS signal line are SPACE status
		Out	DCD and RTS signal line are Mark status
ON	X-ON/X-OFF Control	In	Send X-ON code 11H on TXD signal line
		Out	Send X-OFF code 13H on TXD signal line

Figure 3－15 Two Kinds of Handshaking Modes

Various serial interface and PC standard serial connecting method as figure 3-16:

Signal	Pin No. of printer interface			Pin No. of PC		Signal instruction
	DB 25	IDC10	5PIN	DB25	DB9	
RXD	2	3	3	2	3	Printer receives data from host
TXD	3	2	2	3	2	Printer sends data, connect to the host according to if needs connecting or not.
RTS	5	8	4	5	8	The mark of printer is busy, connect to the host according to if needs connecting or not.
DSR	6	6	1	6	6	The mark of printer is online, connect to the host according to if needs connecting or not.
GND	7	5	5	7	5	power ground

DCD	8	1		8	1	same as CTS, connect to the host according to if needs connecting or not.

Figure 3－16　Two Kinds of Handshaking Modes

DB25 hole printer and PC serial wiring as figure3-17：

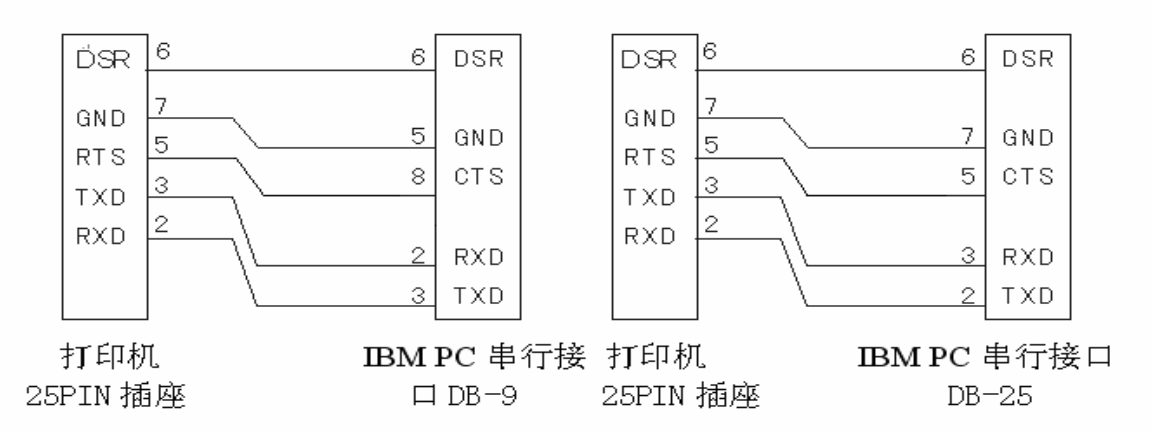


Figure3-17　Connection diagram of DB25 hole printer and PC serial

3.2 Parallel interface connection

SP micro dot matrix printers adopt parallel interface, which is compatible with CENTRONICS standard, and the interface socket are IDC26-pin needle cable socket and DB25 needle socket, the pin order of various parallel port is as following：

Pin Order of IDC26 Parallel Port is as figure 3-18：

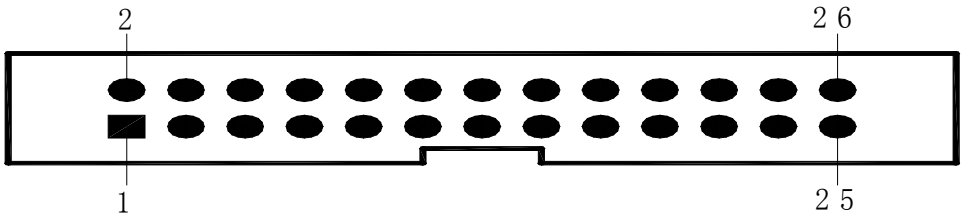


Fig.3-18 Pin Order of IDC26 Parallel Port

Pin Order of DB25 Parallel Port is as figure 3-19：

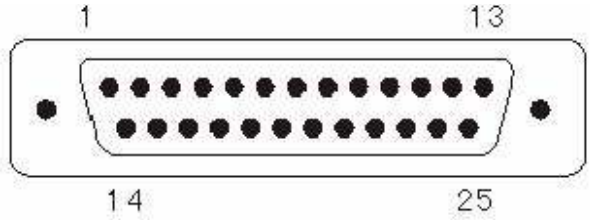


Fig.3-19 Pin Order of DB25 Parallel Port

Pin assignment of two kinds of parallel interface is as figure 3-20：

Pin No. of IDC26	Pin No. of DB25	Signal	Direction	Instruction
1	1	/STB	In	Strobe pulse to latch data,reading occurs at falling edge.
3	2	DATA1	In	These signals represent the 1st bit to 8th bit of the parallel data representatively, each signal is at HIGH level when data is logic 1, and LOW when data is logic 0.
5	3	DATA2	In	
7	4	DATA3	In	
9	5	DATA4	In	
11	6	DATA5	In	
13	7	DATA6	In	
15	8	DATA7	In	
17	9	DATA8	In	
19	10	/ACK	Out	Answering pulse, LOW level signal indicates that data have already been received and the printer gets ready to receive the next data.
21	11	BUSY	Out	HIGH level signal indicates that the printer is BUSY and can not receive data.
23	12	/PE	Out	High level signal indicates that paper is end. Low level indicates having paper.
25	13	SEL	---	Pulling up to HIGH level signal by a resistor indicates the printer is on line.
4	15	/ERR	Out	Pulling up to HIGH level signal by a resistor indicates that there is no error.
2、6、8、26	14、16、17	NC	---	No connection
10、12、14、16、18、20、22、24	18-25	GND	---	Grounding logical 0 level

Fig.3-20 Pin Assignment of Parallel Interface

Notice: （1）“In” denotes input to the printer,“Out” denotes output from the printer.

（2）Signal level is TTL standard.

3.3 Buttons and Indicators

SP series micro printer have two kinds of two buttons and one button, series of A、DIII、DIV、T have two buttons,B、C、DN、DVII have one,two button are on_line button SEL and feed button LF. One button only has LF.

SP series micro printers have two kinds of two indicators and one indicator,series of CDIIIDIVT have two,the power and on_line indicator SEL ,ABDNDVIIhave one SEL,when SEL indicator light shows printer works, or printer is outline or busy.

(1) Self-test mode:

Hold down SEL button and turn it on, the printer will print out the self-test receipt.As two buttons series printer,first press SEL button to turn off SEL indicator,then hold LF button and press SEL at the same time,the printer will print self-test receipt.

（2）Paper feeding mode:

For one button printer：hold down LF button, the printer will feed paper,then release it, the printer will stop feeding； for two buttons printer： first hold down SEL button,then press LF button, the printer will feed paper ,hold down LF button again , it will stop feeding.

3.4 Self-test

The self-test will check the condition of printer, if the printer prints out the self-test receipt correctly, it means the printer works normally. Otherwise it needs to repair.

3.5 Printer Initialization

There are three kinds of modes for printer initialization. The first one is that the host sends command to the printer with control code ESC@, realizing initialization through software. The second one is that realizing initialization through self-test. The third one is that power on initialization. The contents of initialization include: select default of each control code, namely the dot number of line spacing is 3, no binding length, vertical and horizontal tab value are both 0, left and right margin width are both 0, enlarging multiple is 2; cancel all the user-defined characters or graphics characters; select character set 1 and select non reverse white print etc.; For watching the receipt bar conveniently,the default direction are different,for example,T series is

forward,others are inverse.

Chapter 4 Print command

4.1 Summary

Dot matrix printer support printing commands all compatible with traditional ESC printing commands.Each command is described in following format:

Command name		Function
Format:	ASCII：	the standard ASCII character sequence
	Decimal:	the Decimal number sequence
	Hexadecimal:	the Hexadecimal number sequence

Explanation: what the command does and how to use it.

Example: some examples are listed to illustrate the command for better understanding. The following is the description of each command according to the function of each command. The following examples all printed with A series,and inverse,the bottom of receipt bar is printed first.

4.2 Commands details

4.2.1 Paper Feeding Commands

LF		Feed Line
Format: ASCII：	LF	
Decimal：	10	
Hexadecimal：	0A	

Explanation:

All the data in buffer will be printed and feeds paper forwards one line when send one LF.The effect is the same as CR, if using both LF and CR commands,only one command will work.

ESC J				n Dot Line Feed
Format：	ASCII：	ESC	J	n
	Decimal：	27	74	n

Hexadecimal：	1B	4A	n

Explanation:

The printer feeds paper n dot lines. n=0~255.

This command sends carriage return and feed line. It won't influence the latter feed line command. If you need to feed paper immediately but no carriage return, can use ESC J command. Line spacing will be adjusted automatically when using commands ESC V、 ESC W and FS W for enlarge characters.

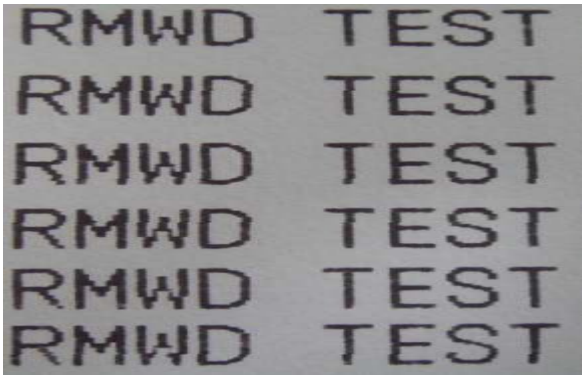
ESC 1 Set n Dot-line Spacing

Format：ASCII：	ESC	1	n
Decimal：	27	49	n
Hexadecimal：	1B	31	n

Explanation：

```
FOR I=1 TO 11 STEP 2
LPRINT CHR$(27);CHR$(49);CHR$(I);      'ESC 1   Set line space
LPRINT "RMWD TEST"                     'print characters and feed line
NEXT I
```

The print result of the said programs is as following:



Explanation:

The line spacing is set to n dot-lines for future Line Feed command. n=0~255, default setting n=3 for text printing, n=0 for bit map printing when using ESC K command.

The BASIC programs for observing the effect of this command are as below:

```
FOR I=1 TO 11 STEP 2
```

```
LPRINT CHR$(27);CHR$(49);CHR$(I);     'ESC 1 set line spacing
LPRINT "RMWD TEST"            'print character string and feed line
NEXT I
```

4.2.2 Format Setting Commands

FF — Feed Page

Format:：	ASCII：	FF
	Decimal：	12
	Hexadecimal：	0C

Explanation:

Feed paper to the beginning of the next page.

ESC C — Set Page Length

Format：	ASCII：	ESC	C	n
	Decimal：	27	67	n
	Hexadecimal：	1B	43	n

Explanation：

The page length is set to n character lines. n=0~255, when n=0, the page length is 256 lines. Default n=40.

ESC N — Set Binding Length

Format：	ASCII：	ESC	N	n
	Decimal：	27	78	n
	Hexadecimal：	1B	4E	n

Explanation：

The binding length is set to n lines. n=0~255, default n= 0. In SP-T, binding length denotes the number of blank line between one page and the next page.

Example: set binding length to 3 lines, send the following sequence to the printer:

ASCII：	ESC	N	ETX
Decimal：	27	78	3
Hexadecimal：	1B	4E	03

```
LPRINT    CHR$(27); "N"; CHR$(3);
```

The BASIC programs for sending the said sequence are as below:

LPRINT CHR$（27）；“N”; CHR$ (3)

ESC O — Cancel Binding Length

Format：ASCII：	ESC	O	
Decimal：	27	79	
Hexadecimal：	1B	4F	

Explanation：

The binding length is set to 0 line, it means the printer will print line-by-line, won’t vacate blank lines between each page.

ESC B — Set Vertical Tab Value

Format：ASCII：	ESC	B	n1	n2	n3…NUL
Decimal：	27	66	n1	n2	n3…0
Hexadecimal：	1B	42	n1	n2	n3…00

Explanation：

The vertical tab positions are entered as n1, n2 and so on, all of these should be within the page length set by ESC C command.

Command NUL added at the end indicates the command is over.

All vertical tab positions that input can be deleted by using this command in ESC B NUL format. VT command is to carry out vertical tab, the paper fed to the next vertical position.

Example: set three vertical tab values at 2nd line, 5th line, 8th line in one page, you can send the following commands:

ASCII:	ESC	B	STX	ENQ	BS	NUL
Decimal:	27	66	2	5	8	0
Hexadecimal:	1B	42	02	05	08	00

The BASIC programs for this example are as below:

LPRINT CHR$(27); CHR$(66);CHR$(2);CHR$(5);CHR$(8);CHr$(0); ‘ESC B command

LPRINT CHR$(11); VT command

LPRINT “SPRM1” Print character string

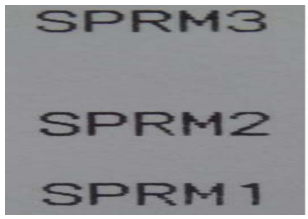
LPRINT CHR$(11); VT command

LPRINT “SPRM2” Print character string

LPRINT CHR$(11); VT command

LPRINT “SPRM3” Print character string

The print result in dot matrix is as following:



VT Carry out Vertical Tab Value

Format：	ASCII：	VT
	Decimal：	11
	Hexadecimal：	0B

Explanation：

Feed paper to the next vertical tab position which is set by ESC B command.

Notice: if there is no vertical tab value setting, or the current position equals or is beyond the last vertical tab position, VT command is to feed paper one line only (same to LF command).

ESC D Set Horizontal Tab Value

Format：	ASCII：	ESC D n1 n2 n3……NUL
	Decimal：	27 68 n1 n2 n3……0
	Hexadecimal：	1B 44 n1 n2 n3……00

Explanation：

The tab positions are entered as n1, n2 and so on, all of these should be within the line width of this model printer. Command NUL added at the end indicates the command is over.

All horizontal tab positions that set can be deleted by using this command in ESC D NUL format.

HT command is to carry out horizontal tab.

Example ：set three horizontal tab values at 2^{nd}, 9^{th} line, 14^{th} character position in one line, you can send the following commands:

ASCII： ESC D STX HT SO NUL

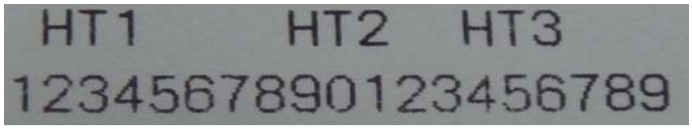
Decimal： 27 68 2 9 14 0

Hexadecimal：1B 44 02 09 0E 00

The BASIC programs for this example are as below:

```
LPRINT "1234567890123456789"                                    Ruler
LPRINT CHR$(27); CHR$(68);CHR$(2);CHR$(9);CHR$(14); CHR$(0);'ESC Dcommand
LPRINT CHR$(9);                                                 HT command
LPRIN "HT1";                                                    Print character string
LPRINT CHR$(9);                                                 HT command
LPRINT "HT2";                                                   Print character string
LPRINT CHR$(9);                                                 HT command
LPRINT "HT3";                                                   Print character string
LPRINT CHR$(13);
```

The print result in dot matrix is as following:



HT — Carry out Horizontal Tab Value

Format:	ASCII:	HT
	Decimal:	9
	Hexadecimal:	09

Explanation:

The print position is advanced to the next horizontal tab position which is set by ESC D command. Note : If there is no horizontal tab value setting, or the current position equals or is beyond the last horizontal tab position, HT command won't be carried out.

ESC f — Print Blank Characters or Lines

Format:	ASCII:	ESC	f	m	n
	Decimal:	27	102	m	n
	Hexadecimal:	1B	66	m	n

Explanation:

When m=0, ESC f NUL n will command to print n blank characters, the value of n should be within the line width of this model printer.

When m=1, ESC f SOH n will command to print n blank lines. n=0~255.

Example: print 6 blank characters in one line, you can send the following commands:

ASCII：	ESC	f	NUL	ACK
Decimal：	27	102	0	6
Hexadecimal：	1B	66	00	06

Another example: print 6 blank lines, you can send the following commands:

Format：ASCII：	ESC	f	SOH	ACK
Decimal：	27	102	1	6
Hexadecimal：	1B	66	01	06

ESC l Set Left Margin

Format：ASCII：	ESC	l	n
Decimal：	27	108	n
Hexadecimal：	1B	6C	n

Explanation：

The value of n should be in the range from 0 to the line width of this model printer. Default n=0, that means no left margin.

This command sets absolute position, and won't be influenced by character enlarging commands ESC U and ESC W.

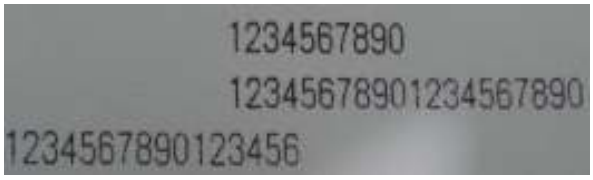
Example: set left margin value to 12, you can send the following commands:

ASCII：	ESC	1	FF
Decimal：	27	108	12
Hexadecimal：	1B	6C	0C

The BASIC programs for this example are as below:

```
LPRINT "1234567890123456"                                    Ruler
LPRINT  CHR$(27); CHR$(108);CHR$(12);                        ESC 1 command
LPRINT "12345678901234567890123456789O"
```

The print result in dot matrix is as following:



ESC Q Set Right Margin

Format：	ASCII：	ESC	Q	n
	Decimal：	27	81	n
	Hexadecimal：	1B	51	n

Explanation：

The value of n should be in the range from 0 to the line width of this model printer. Default n=0, that means no right margin.

This command sets absolute position, and won't be influenced by character enlarging commands ESC U and ESC W.

After setting this command, the printer will auto add feed line as long as the right margin position is reached.

Example: set right margin value to 12, you can send the following commands:

ASCII： ESC Q ACK

Decimal： 27 81 12

Hexadecimal： 1B 51 0C

The BASIC programs for this example are as below:

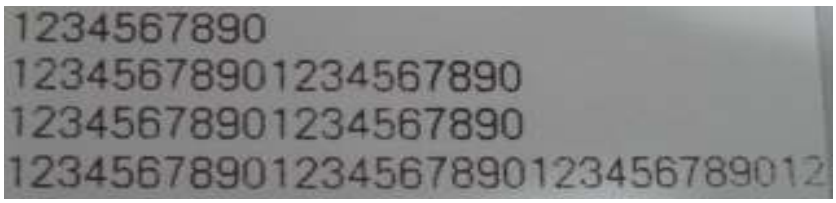
LPRINT "12345678901234567890123456789012" Ruler

LPRINT CHR$(27); CHR$(81);CHR$(12); ESC Q command

LPRINT "123456789012345678901234567890";

LPRINT "12345678901234567890"

The print result in dot matrix is as following:



4.2.3 Character Setting Commands

ESC U Enlarge Width

Format：	ASCII：	ESC	U	n
	Decimal：	27	85	n
	Hexadecimal：	1B	55	n

Explanation：

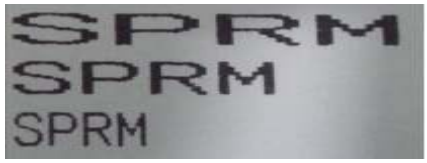
The characters and graphics following this command are printed at n times of normal width,

n=1～4, default n=1, that means normal width, no width enlarging.

The BASIC programs for observing the enlarging effect of this command are as below:

```
FOR I=1 TO 3
LPRINT CHR$(27); CHR$(85); CHR$(I);          ESC U command
LPRINT  "SPRM"                               Print character string
NEXT I
```

The print result in dot matrix is as following:



ESC V Enlarge Height

Format：	ASCII：	ESC	V	n
	Decimal：	27	86	n
	Hexadecimal：	1B	56	n

Explanation：

The characters and graphics following this command are printed at n times of normal height, n=1～4, default n=1.This command should be sent at the beginning of one line.

The BASIC programs for observing the enlarging effect of this command are as below:

```
FOR I=1 TO 3                                 from 1 to 3 times
LPRINT CHR$(27); CHR$(86); CHR$(I)           ESC V command
LPRIN  "SPRM"                                Print character string
NEXT I
```

The print result in dot matrix is as following:

ESC W Enlarge Width and Height

Format：	ASCII：	ESC	W	n
	Decimal：	27	87	n
	Hexadecimal：	1B	57	n

Explanation：

The characters and graphics following this command are printed at n times of normal width and height, n=1～4, default n=1.

```
FOR I=1 TO 3                                    from 1 to 3 times
LPRINT CHR$(27); CHR$(87); CHR$(I);             ESC W command
LPRINT "SPRM"                                   Print character string
NEXT I
```

The print result in dot matrix series is as following:

ESC -　　Select/cancel Underline Print

Format：	ASCII：	ESC	-	n
	Decimal：	27	45	n
	Hexadecimal：	1B	2D	n

Explanation：

When n=1, select underline print; when n=0, cancel underline print.

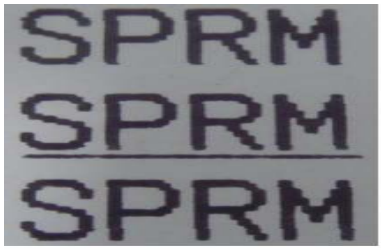
All characters including spaces will be printed out with underline after selecting underline print command, unless cancel the underline print command.

The BASIC programs for observing the effect of this command are as below:

```
LPRINT CHR$(27); CHR$(57); CHR$(2);      Enlarge the width and height twice
LPRINT "SPRM"
LPRINT CHR$(27); CHR$(45); CHR$(1);      Select underline print
LPRINT "SPRM"                            Dot matrix print with underline
LPRINT CHR$(27); CHR$(45); CHR$(0);      Cancel underline print
```

LPRINT ”SPRM”

The print result in dot matrix is as following:



ESC + Select/cancel Up-line Print

Format：	ASCII：	ESC	+	n
	Decimal：	27	43	n
	Hexadecimal：	1B	2B	n

Explanation：

When n=1, select up-line print; when n=0, cancel up-line print.

All characters including spaces will be printed out with up-line after selecting up-line print command, unless cancel the up-line print command.

The BASIC programs for observing the effect of this command are as below:

LPRINT CHR$(27); CHR$(57); CHR$(2); Enlarge the width and height twice

LPRINT “SPRM”

LPRINT CHR$(27); CHR$(43); CHR$(1); Select up-line print

LPRINT ”SPRM” dot matrix print with up-line

LPRINT CHR$(27); CHR$(45); CHR$(0); Cancel up-line print

LPRINT ”SPRM”

The print result in dot matrix series is as following:

ESC 6 Select Character Set I

Format：	ASCII：	ESC	6
	Decimal：	27	54

Hexadecimal： 1B 36

Explanation：

All characters following this command are printed using the character set I.
There are two character sets are available for SP micro dot matrix printers,
character set I is selected at power on or on ESC @ command.

ESC 7 Select Character Set II

Format：ASCII： ESC 7

Decimal： 27 55

Hexadecimal： 1B 37

Explanation：

All characters following this command are printed using the character set II, please refer to ESC 6.

SO Set double width character print

Format：ASCII： SO

Decimal： 14

Hexadecimal： 0E

Explanation：

All characters following this command on the same line are printed at twice their normal width, this command can be deleted by a carriage return or DC4 command. Normal characters and width-enlarged characters can be printed on the same line.

DC4 Cancel double width character print

Format：ASCII： DC4

Decimal： 20

Hexadecimal： 14

Explanation：

Double width print mode which is set by SO command can be canceled by DC4 command. This command doesn't cancel width enlarging print which set by ESC U and ESC W.

ESC i Select/cancel Reverse White Print

Format： ASCII： ESC i n

Decimal： 27 105 n

Hexadecimal： 1B 69 n

Explanation：

When n=1, select reverse white print; when n=0, cancel reverse white print.

Reverse white print is printing in the black background, just like the film of photography. It is normal print that printing black characters in white background, the default is canceling reverse white print.

The BASIC programs for reverse white print are as below:

LPRINT CHR$(27); CHR$(105); CHR$(1), Select reverse white print

LPRINT "SPRD"

The print result in dot matrix series is as following:

ESC c Select/cancel Reverse Print

Format:	ASCII:	ESC	c	n
	Decimal:	27	99	n
	Hexadecimal:	1B	63	n

Explanation:

When n=1, select reverse print; when n=0, cancel reverse print.

SP-T printers default n=0,others n=1.

Notice:

Reverse print not only supports character mode but also supports graphics and Chinese mode. When print the graphics in reverse direction, pay attention to the print order of graphic units, please see ESC K command.

4.2.4 User-defined Character Setting Commands

ESC & User-defined Characters

Format:	ASCII:	ESC	&	m	n1	n2……n6
	Decimal:	27	38	m	n1	n2……n6
	Hexadecimal:	1B	26	m	n1	n2……n6

Explanation:

This command allows a character to be defined, parameter m is the code of user-defined character, m=32～255.Parameter n1, n2, …n6 are the structure codes of user-defined character.

The character size is 6 × 8 dots. Each row is denoted by one byte data, the

MSB is on the top, as the below figure shows:

The user-defined characters are stored in printer RAM until power off.

If many ESC & commands use same m value, only the last one is valid. User can define at most 32 characters. Please refer to ESC % and ESC : commands.

ESC % Replace with User-defined Characters

Format：ASCII：	ESC	%	m1	n1	m2	n2……mk	nk	NUL
Decimal：	27	37	m1	n1	m2	n2……mk	nk	0
Hexadecimal：	1B	25	m1	n1	m2	n2……mk	nk	00

Explanation：

This command is used to replace the character n with the user-defined character m, and the user-defined character m will be printed out as the replacement of character n.

m1, m2……mk are the codes of user-defined characters.

n1, n2……nk are codes of characters in the current character set – the replaced characters.

The values of m and n both should be in the range 32 to 255. The subscript K=1～32, the maximum number of replaced characters is 32.

Character NUL added to the end means the command is over.

Please refer to ESC & and ESC : commands.

ESC : Restore Characters that in Character Set

Format：ASCII：	ESC	:
Decimal：	27	58
Hexadecimal：	1B	3A

Explanation：

This command is used to restore the original characters in the character set replaced by

user-defined characters using ESC % command. However, user-defined characters won't be deleted from the RAM in printer and may brought back again with ESC % command.

The BASIC programs for observing the effect of ESC &, ESC % and ESC : are as below:

```
10  LPRINT CHR$(27); "W"; CHR$(8);                    ' Enlarge width eighteen times
20  LPRINT CHR$(27); "&"; CHR$(65);                   'ESC & command
30  LPRINT CHR$(&H02); CHR$(&H7C); CHR$(&H40);
40  LPRINT CHR$(&HC0); CHR$(&H40); CHR$(&H00);
50  LPRINT CHR$(27); "%"; CHR$(65); CHR$(65); CHR$(0); 'ESC %command
60  LPRINT CHR$(65); CHR$(13);                        'Print user-defined characters
70  LPRINT CHR$(27); CHR$(58);                        ' ESC : command
80  LPRINT CHR$(65);                                  'Restore characters in the character set
```

The print result in dot matrix series is as following:

4.2.5 Graphics Print Commands

ESC K — Print bit-map graphics

Format:	ASCII:	ESC	K	n1	n2……data……
	Decimal:	27	75	n1	n2……data……
	Hexadecimal:	1B	4B	n1	n2……data……

Explanation:

This command is used to print （n2×256+n1）×8bit map. The width of this graphics is n2×256+n1 dots. Each column has 8 dots and can be presented by a 8-bit byte, the MSB is on the top. The values of n1, n2 denote a 16-bit binary data, n1 is LSB, n2 is MSB, n2 ×256 + n1 denotes the width of this printing graphics, in dot matrix series, n2 =0, n1 should be in the range from 1 to the max. dots number of each line of this model printer. Data are the bytes of relative columns in the graphics sequential from left to right, the number of bytes should equal n1, when the height of the graphics is larger than 8 dots, it can be marked off several units according to 8 dot lines for each graphic unit, when the dots are fewer than 8,

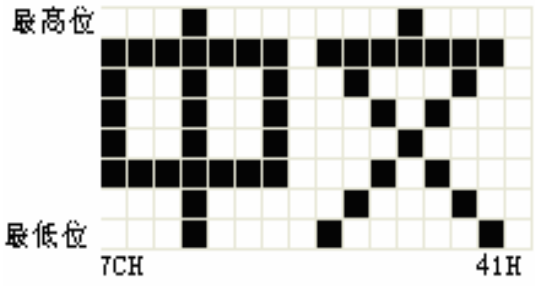
use blank dots to make up it, then print out every graphic unit with ESC K command orderly, at last compose an intact graphics. Notice: when adopting reverse print mode, you should print every graphic unit sequentially according to the order from top to bottom of the graphics.

For example: If you want to print two Chinese characters “中文” with ESC K command, the bit- map for the two Chinese is as the below figure shows.

Each character is composed by 7 × 8 dots to 7 columns, there is a space between the two characters, so totally there are 15 columns, then n1=15, n2=0, the 15-byte data showed in hexadecimal are as follows:

7C, 44, 44, FF, 44, 44, 7C, 00, 41, 62, 54, C8, 54, 62, 41

7C,44,44,FF,44,44,7C,00,41,62,54,C8,54,62,41



The BASIC programs for this example are as below:

```
LPRINT CHR$(27)；“W”；CHR$(4)；                    ’Enlarge the width and height 4 times
LPRINT CHR$(27)；“K”；CHR$(15)；CHR$(0)；                    ’ESC K command
LPRINT CHR$(＆H7C)；CHR$(＆H44)； CHR$(＆H44)；CHR$(＆HFF)；
LPRINT CHR$(＆H44)；CHR$(＆H44)； CHR$(＆H7C)；CHR$(＆H00)
LPRINT CHR$(＆H41)；CHR$(＆H62)； CHR$(＆H54)；CHR$(＆HC8)
LPRINT CHR$(＆H54)；CHR$(＆H62)； CHR$(＆H41)；
LPRINT CHR$(10)；CHR$(13)；                                CR to print this line
```

The print result in dot matrix series is as following:

中文

ESC ‘ Print Curve

Format：	ASCII：	ESC	‘	m	n1	n2……nm	CR
	Decimal：	27	39	m	n1	n2……nm	13
	Hexadecimal：	1B	27	m	n1	n2……nm	0D

Explanation：

This command is designed to print curving graphics along with the paper feeding direction. The

value of m is the line number of the printing curve,it should be within the range of the max. dots number of each line of this model printer.

There are m curving dots in one horizontal line. n1, n2…. nm denote the position of m curves. The value of nm should equal m and each nm should be within the range of the max. dots number of each line of this model printer. The last CR (Carriage Return) lets the printer print out the current dot line, so a set of dot lines will be printed out form m-line curving graphics based on the data of n1, n2…. Nm.

4.2.6 Initialization Commands

ESC @			Initialize Printer
Format：	ASCII：	ESC	@
	Decimal：	27	64
	Hexadecimal：	1B	40

Explanation：

This command is to initialize the following contents of the printer:

·Clear the data in the print buffer;

·Restore the default;

·Select character set 1;

·Delete user-defined characters.

4.2.7 Data Control Commands

CR			Carriage Return
Format：	ASCII：	CR	
	Decimal：	13	
	Hexadecimal：	0D	

Explanation：

If a “CR” command is sent to printer the total data in the print buffer will be printed out and paper will be fed for one line forwards. The result is same as LF,if use both LF and CR commands at the same time,only one command will be effective.

CAN	Cancel One Line

Format：ASCII：	CAN	
Decimal：	24	
Hexadecimal：	18	

Explanation：

This command is to cancel all the characters in the print buffer before this command code, and return to the last carriage return code. It doesn't cancel any control code sequences in the current line.

DEL Delete One Character

Format：ASCII：	DEL	
Decimal：	127	
Hexadecimal：	7F	

Explanation：

This command is to delete one character in the print buffer, it doesn't delete the control code unless this character has been printed.

NUL NUL

Format：ASCII：	NUL	
Decimal：	0	
Hexadecimal：	00	

Explanation：

NUL command is used as the final code in some commands such as ESC B,
ESC D, ESC % and ECS ‘, denotes these commands are over.
NUL command is ignored when used alone.

ESC ” Select/cancel Hexadecimal print

Format：ASCII：	ESC	”	n
Decimal：	27	34	n
Hexadecimal：	1B	22	n

Explanation：

Hexadecimal dump print mode is turned on if n=1, and turned off if n=0,
when Hexadecimal dump print mode is turned on, all data sent from the host computer will be printed out in hexadecimal.
For example: when send the following data from the host computer to the printer
LPRINT CHR$ (0); CHR$ (27); “A”; CHR$ (24);

These data will be printed out in hexadecimal:

00 1B 41 18

Hexadecimal print mode carries out print only when the print buffer is full.

4.2.8 Chinese Character Print Control Commands

Chinese character print commands adopt FS standard commands. The Chinese character library is the level I, II Chinese characters, graphics and symbols which all meet the specifications of GB2312-80. Each Chinese character or character is presented by 2-byte GB code. This series adopt internal code which is corresponding GB code to denote the Chinese characters.
Notice：only the commands with * are effective in series CF and TF, and only receive Chinese command and CR、LF.
The following is the description for these commands.

FS & *Select Chinese Print Mode*

Format：ASCII：	FS	&	
Decimal：	28	38	
Hexadecimal：	1C	26	

Explanation：

After printer received this command, it will switch from ASCII character print mode to Chinese character print mode. Using GB Chinese character library level I, II.

FS · * Cancel Chinese Print Mode*

Format： ASCII：	FS	·	
Decimal：	28	46	
Hexadecimal：	1C	2E	

Explanation：

After printer received this command, it will switch from Chinese character print mode to character print mode.

FS SO *Set Chinese Double Width Print*

Format：ASCII：	FS	SO	
Decimal：	28	14	
Hexadecimal：	1C	0E	

Explanation：

Characters following this command are printed at twice their normal width, does not enlarge the height. Notice：the command only be effective in one line.

FS DC4 Cancel Chinese Double Width Print*

Format：ASCII：	FS	DC4	
Decimal：	28	20	
Hexadecimal：	1C	14	

Explanation： This command is to cancel FS SO command.

FS W Set the Enlarging Multiple of Chinese Character

Format：ASCII：	FS	W	n
Decimal：	28	87	n
Hexadecimal：	1C	57	n

Explanation：

Characters following this command are printed at twice their normal width and height. When n=1, this command is selected, when n=0, it is canceled.

FS J Set Vertical Print

Format：ASCII：	FS	J	
Decimal：	28	74	
Hexadecimal：	1C	4A	

Explanation：

This command is to print Chinese characters vertically, namely printing by rotating widdershins for 90^{o}

FS K Set Horizontal Print

Format：ASCII：	FS	K	
Decimal：	28	75	
Hexadecimal：	1C	4B	

Explanation：

This command is to print Chinese characters horizontally, if have not set rotation, the Chinese characters will be printed horizontally, that is normal print status.

FS I Set Chinese Character Rotational Print

Format：ASCII：	FS	I	n
Decimal：	28	73	n

Hexadecimal： 1C 49 n

Explanation：

This command is to rotate Chinese characters, the values of n are as following:

n	Chinese characters rotated widdershins
0	0°
1	90°
2	180°
3	270°

FS - Chinese Character with Underline Print

Format： ASCII： FS - n

Decimal： 28 45 n

Hexadecimal： 1C 2D n

Explanation：

The specified Chinese characters after this command are printed with underline. When n=1, underline selected; when n=0, it canceled.

FS r Select Superscript and Subscript Print

Format： ASCII： FS r n

Decimal： 28 114 n

Hexadecimal： 1C 72 n

Explanation：

This command is to select the position for superscript and subscript, n=0 is superscript and n=1 is subscript. Notice: this command is only valid for 16×8, 8 ×8 Chinese characters and 5×7 or 6×8 ASCII characters, so before using this command, the Chinese characters or ASCII characters which are regarded as superscript and subscript for print, should be set firstly using FS i or FS ·command.

FS SI Select Vertical DBC Case Chinese Character Print

Format： ASCII： FS SI

Decimal： 28 15

Hexadecimal： 1C 0F

Explanation：

After the printer received this command, it will print Chinese characters with 8×16 dots.（the command only be effective for16×16 dots）

FS DC2 Cancel Vertical DBC Case Chinese Character Print

Format：	ASCII：	FS	DC2
	Decimal：	28	18
	Hexadecimal：	1C	12

Explanation：

This command cancels FS SI, restore to print Chinese characters with 16×16 dots.（the command only be effective for16×16 dots）

FS i Select Chinese Character Bit Map

Format：	ASCII：	FS	i	n
	Decimal：	28	105	n
	Hexadecimal：	1C	69	n

Explanation：

This command is to select Chinese characters with different bit map, as the following tab shows:

n	汉字点阵Chinese Character Bit Map
0	16*16
1	8*16
2	16*8
3	8*8

Characters with different bit map can be printed in one line, but before the Chinese character code, should set the bit map with FS i or FS SI command firstly.（the command only be effective for16×16 dots）

FS G Select Chinese Character Misplace Print

Format：	ASCII：	FS	G
	Decimal：	28	71
	Hexadecimal：	1C	47

Explanation：

This command is to set Chinese character misplace print. The characters that put in the printer after this command will be printed out in misplace mode, namely Chinese characters will become thicker and heavier than normal single-line ones, can be used for printing titles or printing heavily.

FS H Cancel Chinese Character Misplace Print

Format：	ASCII：	FS	H
	Decimal：	28	72
	Hexadecimal：	1C	48

Explanation：

This command is to cancel Chinese character misplace print, and restore to normal single-line Chinese character print mode.

4.3 Printer default parameter setting commands

The setting command is used to set printer default parameters,only set once before using,the parameter will be stored into inner FLASH,it doesn't change after power off.Notice,some commands could change parameter in normal mode,but the content can not be stored into FLASH,the setting still be the former default after power off or initialization.

4.3.1 Enter、exit setting mode

ESC HT Enter setting mode

Format：	ASCII：	ESC	HT
	Decimal：	27	09
	Hexadecimal：	1B	09

Explanation：

Enter setting mode.Only enter into setting mode,you can change parameter setting value.

ESC NAK Exit setting mode

Format：	ASCII：	ESC	NAK
	Decimal：	27	21
	Hexadecimal：	1B	15

Explanation：

Exit setting mode.The setting parameter can be stored only after carry out exit setting mode

command rightly.

4.3.2 Printer basic parameter setting

ESC # Serial parameter setting

Format：	ASCII：	ESC	#	n
	Decimal：	27	35	n
	Hexadecimal：	1B	23	n

Explanation：

The command set serial parameter, n means serial baud rate and data format,as following figure：

Bit	Function	0	1
D0	Baud rate	000~111 are 1200,2400,4800,9600,19200,38400,57600,115200	
D1			
D2			
D3	handshaking protocol	XON/XOFF	RTS/CTS
D4	Character length	7bits	8bits
D5	Parity	Have	None
D6	Parity method option	Even parity	Odd parity
D7	Data receive error handling	Ignore	Print“？”

Default,n=FBH ： 9600,no parity,8bits data,RTS/CTS handshaking protocol,print“？”,printer will return value of n after received commands.

ESC ! Font dots setting

Format：	ASCII：	ESC	!	n
	Decimal：	27	33	n
	Hexadecimal：	1B	21	n

Explanation：

Set Chinese、character dots in Chinese mode.

n=00H ： 16×16 dots Chinese ,8×16dots character； n=01H： 12×12dots Chinese ,6×12dots character； default n=00H, printer will return value of n after received commands.

FS & Default Chinese mode set when power on

Format：	ASCII：	FS	&
	Decimal：	28	38
	Hexadecimal：	1C	26

Explanation：

Set default is Chinese mode when switched on,printer will return to 01H after received command.

FS . Default ANK mode set when power on

Format：ASCII：	FS	.	
Decimal：	28	46	
Hexadecimal：	1C	2E	

Explanation：

Set default is Chinese mode when switched on,printer will return to 01H after received command.Default is ANK mode when exit factory.

ESC c Print direction setting

Format：ASCII：	ESC	c	n
Decimal：	27	99	n
Hexadecimal：	1B	63	n

Explanation：

Set character printing direction,n=00H：forward printing,n=01H ：inverse printing,default：desktop type n=00H,panel type n=01H.printer will return to value n when received command.

Chapter 5 Operation and maintenance

5.1 Print head protection

In order to guarantee the printer works normally, please especially pay attention not to dismantle the print head at random. As to the users who don't use the outer cover of the printer should give their attention to protect the print head even more.

1. If you do not use the printer for a long time, please don't put through the printer on the power.
2. If the printer works abnormally, please turn off the printer power.
3. The power Used must meet the requirements, otherwise it will be disadvantageous to the print head.
4. Don't lubricate the print head.
5. While changing the paper roll, please notice whether there is paper scrap on the print head, if there is, please blow it away gently.
6. While changing the ribbon cassette, don't press the ribbon cassette heavily, otherwise may damage the plastic roller on the printer.
7. Keep the circuit board of the printer clean and dustless.

5.2 Other

Please notice the following aspects too:

1. Don't insert and pull out the chip, if there is abnormity, please hand over to the producer for repairing.
2. Don't lubricate the ribbon cassette, otherwise damage the print head.
3. When you suppress to join the electric wire by yourself, should pay attention to whether your printer port is parallel interface or serial interface, don't connect to the host computer incorrectly.

Chapter 6 Printer Using under Windows

SP micro dot matrix printers can be used under Windows of PC. Installation method is same to the large-scale EPSON printer.

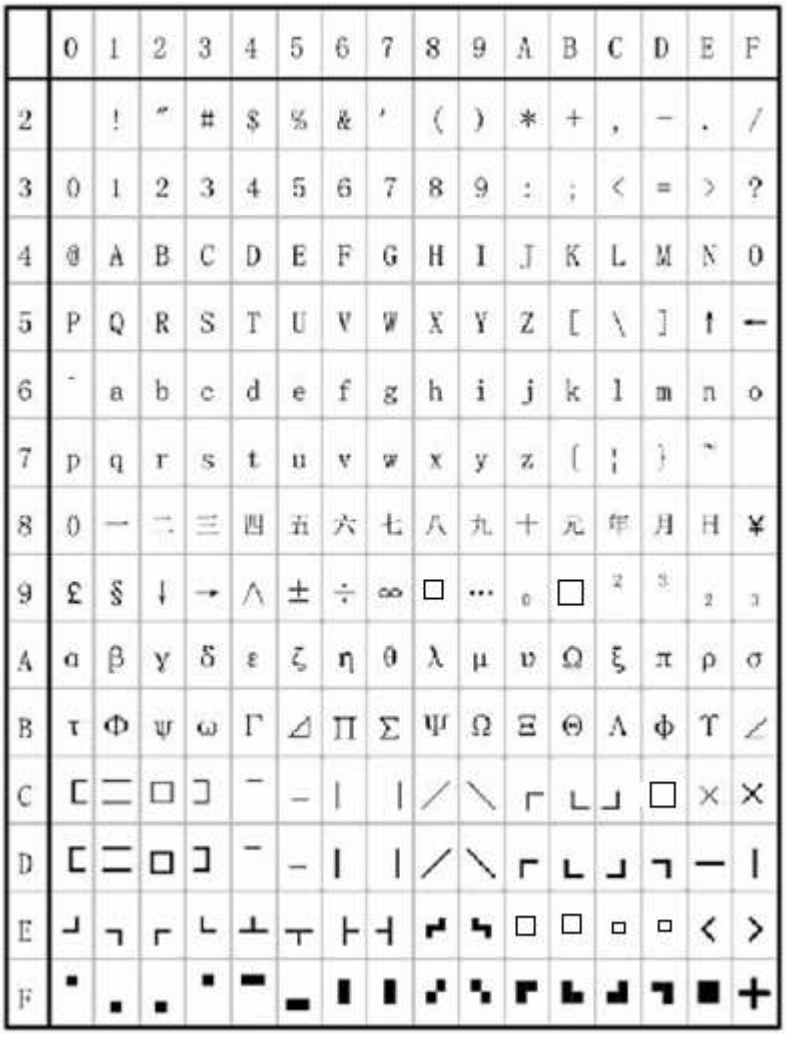
1. start-----set-----printer-----add the printer------default
2. Key in the contents.
3. Set the paper width to 44mm or 57mm, spacing and the length of page are optional.
4. Select serial or parallel interface.
5. Carry out printing (at this time the printer can print out the contents that you have selected or input).

Appendix 1 Valid Codes Tab

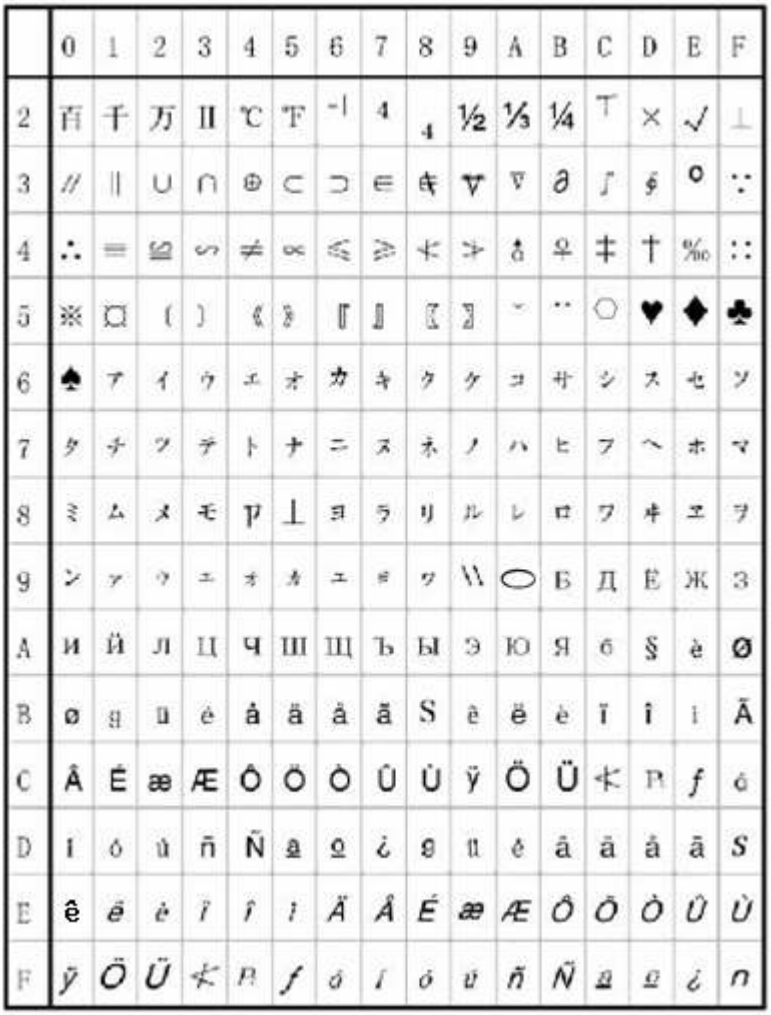
The serial number of valid codes is from 00H to 0FFH, among them

00H-1FH are control codes, 20H-0FFH are character codes. Character codes composed by two character sets, the character codes of each character set are all 20H-0FFH permutation.

Character Set I



Character Set II


0 1 2 3 4 5 6 7 8 9 A B C D E F
2 百 千 万 ㈱ ℃ ℉ ㍍ ㍑ ㎎ ½ ⅓ ¼ ㎜ × √ ⊥
3 // ∥ ∪ ∩ ⊕ ⊂ ⊃ ∈ ∉ ∀ ∂ ∫ ∮ ° ∵
4 ∴ ≡ ≦ ∽ ≠ ∝ ≦ ≧ ≮ ≯ ♂ ♀ ‡ † ‰ ::
5 ※ ☐ ( ) 《 》 〖 〗 〔 〕 ˇ ¨ ○ ♥ ♦ ♣
6 ♠ ア イ ウ エ オ カ キ ク ケ コ サ シ ス セ ソ
7 タ チ ツ テ ト ナ ニ ヌ ネ ノ ハ ヒ フ ヘ ホ マ
8 ミ ム メ モ ㍿ ㍊ ヨ ラ リ ル レ ロ ワ ヰ ヱ ヲ
9 ン ァ ィ ェ ォ ャ ュ ョ ッ \\ ⬭ Б Д Ё Ж З
A И Й Л Ц Ч Ш Щ Ъ Ы Э Ю Я б § è Ø
B ø ù ú é â ä å ã S ê ë è ï î ì Ã
C Â É æ Æ Ô Ö Ò Û Ù ÿ Ö Ü ㍉ ㎡ ƒ ó
D ì ó û ñ Ñ ª º ¿ ® ¬ é â ä å ã S
E ê ë è ï î ì Ä Å É æ Æ Ô Ö Ò Û Ù
F ÿ Ö Ü ㍉ ㎡ ƒ ó í ó ú ñ Ñ ª º ¿ ∩

Appendix 2 Print Commands

Decimal	Hexadecimal	Command Name	Function	Page
0	0	NUL	Ending symbol	33
9	9	HT	Carry out horizontal tab	22
10	0A	LF	Feed line	18
11	0B	VT	Carry out vertical tab	21
12	0C	FF	Feed page	19
13	0D	CR	Carriage return	33
14	0E	SO	Set double width character print	28
20	14	DC4	Cancel SO Command	28
24	18	CAN	Cancel the characters in current line	33
127	7F	DEL	Delete the last character	33
27 34 n	1B 22	ESC ”n	Select/cancel hexadecimal print	33
27 37	1B 25	ESC % m1 n1…mk nk NUL	Replacing code nk is defining code mk	30
27 38	1B 26	ESC & m n n n2…n6	User-defined characters	29
27 39	1B 27	ESC ,m n1 n2…nk	Print m curving dots	32
27 43 n	1B 2B n	ESC +n	Select/cancel up-line print	27
27 45 n	1B 2D n	ESC –n	Select/cancel underline print	26
27 49 n	1B 31 n	ESC 1 n	Set line spacing to n dot lines	19
27 54	1B 36	ESC 6	Select character set I	28
27 55	1B 37	ESC 7	Select character set II	28
27 58	1B 3A	ESC ：	Restore original codes（restore character set ）	30
27 64	1B 40	ESC @	Initialize printer	32
27 66	1B 42	ESC B n1…nkNUL	Set vertical tab value	20

27 67	1B 43	ESC C n	Set page length to n lines	20
27 68	1B 44	ESC D n1…nk NUL	Set horizontal tab value	21
27 74 n	1B 4A n	ESC J N	Feed line n dot lines	18
27 75	1B 4B	ESC K n1…n2…data	Print n×18 bit-map graphics	31
27 78 n	1B 4E	ESC N n	Set binding length to n lines	20
27 79 n	1B 4F	ESC O n	Cancel binding length	20
27 81 n	1B 51 n	ESC Q n	Set right margin width	24
27 85 n	1B 55 n	ESC U n	Enlarge width n times	25
27 86 n	1B 56 n	ESC V n	Enlarge height n times	25
27 87 n	1B 57 n	ESC W n	Enlarge width and height n times	26
27 99 n	1B 63 n	ESC C n	Select/cancel reverse print	29
27 102 m n	1B 66	ESC f m n	Print blank or feed line	23
27 105 n	1B 69 n	ESC i n	Select/cancel reverse white print	28
27 108 n	1B 6C n	ESC l n	Set left margin width	23
28 14	1C 0E	FS SO *	Set double width print of Chinese character	34
28 20	1C 14	FS DC4 *	Cancel FS SO	35
28 15	1C 0F	FS SI	Select vertical DBC case Chinese character print	36
28 18	1C 12	FS DC2	Cancel vertical DBC case Chinese character print	36
28 38	1C 26	FS & *	Select GB level I、II Chinese fonts library	34
28 45 n	1C 2D n	SF – n	Print Chinese characters with underline	36
28 46	1C 2E	FS · *	Cancel Chinese print mode	34
28 71	1C 47	FS G	Select Chinese character misplace print	37

28 72	1C 48	FS H	Cancel Chinese character misplace print	37
28 73 n	1C 49 n	FS I n	Set Chinese character rotational print	35
28 74	1C 4A	FS J	Set vertical print	35
28 75	1C 4B	FS K	Set horizontal print	35
28 87 n	1C 57 n	FC W n	Set the enlarging multiple of Chinese character	35
28 105 n	1C 69 n	FS I n	Select Chinese character bit-map	37
28 114	1C 72 n	FS r n	Select superscript and subscript	36

Explanation：

only the Chinese commands with * are effective in series CF and TF, and only receive Chinese commands and CR、LF.